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ABSTRACT

Noting the agenda-setting hypothesis that the public will adopt the media's agenda of issue priorities after the passage of some time, a study examined the effect of time on the public agenda. The study measured responses of 880 subjects in three survey waves. Evaluations of the importance of seven environmental issues were correlated with week-long intervals of media coverage of those issues for up to 33 weeks preceding each survey. The results indicated that the media had their optimal impact on the public's perceived importance of environmental issues after eight to ten weeks of media coverage. The findings also showed that the correlations between the media agenda and the public agenda tended to increase, peak and level, and then decline with the passage of time. Possible explanations for this effect are discussed. Tables and references are appended. (Author/HTH)

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Time in Agenda-Setting:
The Accumulation of Media Coverage on Audience Issue Salience

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by

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ABSTRACT

Time in Agenda-Setting:

The Accumulation of Media Coverage on Audience Issue Salience

The agenda-setting hypothesis asserts that the public will adopt the media's agenda of issue priorities after the passage of some time. This study measured three survey waves of respondents randomly drawn from the same population. Their evaluations of the importance of seven environmental issues were correlated with week-long intervals of media coverage of those issues for up to 33 weeks preceding each survey. The findings showed that the media had their optimal impact (i.e., "optimal media effect span") on the public's perceived importance of environmental issues after 8-10 weeks of media coverage. The findings also showed that the correlations between the media agenda and the public agenda tended to increase, peak and level, and then decline with the passage of time. Possible explanations for this effect were discussed.

TIME IN AGENDA-SETTING

THE ACCUMULATION OF MEDIA COVERAGE ON AUDIENCE ISSUE SALIENCE

The agenda-setting hypothesis asserts that the media's agenda of issue priorities will, after having been covered in the media for some duration, be adopted by the public as their own agenda of salient issues. Even though time is a crucial variable for understanding the agenda-setting effect, as it is for understanding many media effects (Kline, 1980), most agenda-setting research has examined the sheer amount of media coverage impacting aggregate audience cognitions with little regard for the amount of time the issue or issues have been in the mass media. Logic requires that the media agenda precede the public agenda, since the hypothesis maintains that the media agenda causes the public agenda (Behr and Iyengar, 1985). Researchers have frequently inferred direction of causation by using cross-lagged correlation, pitting the agenda-setting hypothesis against the alternative hypothesis that states that the public agenda causes the media agenda (McCombs, 1977; Tardy et al., 1981; Swanson and Swanson, 1978; Tipton et al., 1975; Sohn, 1978; McCombs et al., 1975). A few studies have used path analysis and multiple regression to infer direction of causation (Kimsey and Atwood, 1979; Weaver et al., 1975; Winter, 1980). While cross-lagged correlation may account for the sequencing of the two variables, the design does not permit researchers to determine how long each variable should be observed. As Chaffee (1972: 7-8) has written: "Selection of the optimal time-lag (in cross-lagged correlation) is no perfunctory matter. If a substantial causal hypothesis is really at stake, the investigator

should presumably know enough about the suspected phenomenon that he will not use a time-lag that is shorter than the period he suspects the process requires. A time lag that exceeds the process is not as serious a matter perhaps, but there is always the danger that a causal effect will 'dissipate' over time if the researcher waits too long to measure it."

Few agenda-setting studies have explicitly incorporated the temporal process into their research, although a few have conceived of time as an underlying process (Elizur and Katz, 1977). An understanding of the time required for media presentation to make an issue or set of issues salient among the public is of value for methodological and theoretical purposes as well as for practical applications.

It makes sense to keep the duration of public agenda as short as possible because any time discrepancies may affect this variable. Nevertheless, the literature reveals that some studies have measured the public agenda for as long as four weeks (McLeod et al., 1974; Gormley, 1975; Sohn, 1978). These are anomalies in the literature, however. Most studies measured the public agenda for one or two weeks (Eyal, 1979). Atwater et al. (1985) measured it for three days; Hilker (1976) measured it for one day.

While the duration of the public agenda should logically be kept as short as possible, there is no logical way for a researcher to determine the duration of the media agenda. And, unfortunately, there is little research to guide the prospective researcher in this area. Most researchers investigating the agenda-setting function have implicitly accepted the notion that audience issue salience is a function of media presentation over time; since their research designs

usually measure the media agenda for some duration before measuring the public agenda. But few researchers have tackled the problem concerning the amount of time required for the news media to make an issue or set of issues salient among the public. Researchers have used media agenda durations ranging from one week (Mullins, 1977) to four and half months (Gormley, 1975) to three years (Cohen, 1975). These differing results may have been due to the researchers' choice of medium or media, choice of issues, and populations observed.

The general model for the design of drawing backward in time from the audience measure was developed by Funkhouser (1973a, 1973b) and Zucker (1978). The design consists of measuring the public agenda at one or more time points and drawing backward in time from that measure by correlating it with numerous subdivided intervals of the entire media duration. In recent years, however, researchers have found that the wholesale use of a variety of issues in a time-related agenda-setting study may mask the differential impacts different issues require to impact the public's cognitions (Winter et al., 1982: 1).

In particular, research has shown that audience members have different levels of direct experience with issues (Zucker, 1978; Weaver et al. 1981). Zucker has conceived of issues as being obtrusive or unobtrusive, to the extent that they obtrude into audience members' life spaces. Thus, the relationship between the media agenda and the audience agenda may differ depending on whether the news media are the only or primary source of information or whether audience members have access to experience with or interpersonal communication about the issues. Most audience members will probably have little experience with such issues as foreign

affairs (Manheim and Albritton, 1984), the environment (Atwater et al., 1985), civil rights (Winter and Eyal, 1981) or rape (Protest et al., 1985). But audience members may find that such issues as health (Culbertson and Stempel, 1984; Hong and Shemer, 1976) and economic matters (Benton and Frazier 1976) touch their lives.

Winter and Eyal (1981) corrected for the problem of differential impacts of different issues on the public by conducting a time-related agenda-setting study that focused on the public's cognitions of a single issue. They compared the results of 27 Gallup polls conducted between 1954 and 1976 concerning the civil rights issue with front-page coverage of the issue in the New York Times. Moving backward in time after each poll, they found that the peak correlations between media presentation and audience salience occurred within four to six weeks. By looking at a single issue, they were able to have some control for any canceling effect an array of issues may have had.

Winter et al. (1982) conducted a study in Canada similar in design to Winter and Eyal's study with the civil rights issue. They correlated front-page coverage of several issues in the Toronto Star with the percentage of respondents who cited each of three issues as most important in Canadian Gallup polls. They found support for their hypothesis that there would be differing agenda-setting relationships for different issues depending on the nature of each issue. They concluded: "Thus, this study provides evidence against the continued treatment of issues in the aggregate. This suggests that it is no longer adequate in agenda-setting research to treat issues en masse, any more than it is to lump respondents together, independent of media use patterns and other contingent conditions" (p. 8).

As a result of these problems relating to the temporal process in agenda-setting research, the present study investigated the following hypothesis: Public priorities of a set of issues in the news will increase, peak, or level, and then decrease as the public agenda is drawn back in time from the media agenda.

METHOD

To test the hypothesis, a global issue was selected for which it was believed that most audience members have little if any direct experience. A set of independent issues related to the global issue were examined. This was done to keep the impact of the public's direct experience with the issue at a minimum. The issue of the environment was selected. Even though the environment is ubiquitous, it is not usually directly observable. Though the environment has been a serious problem in American society for many decades, it did not become a prominent issue until Rachel Carson's (1962) popular book Silent Spring described how DDT and other pesticides were being introduced into the ecological cycle with devastating consequences. Downs (1972) and Zucker (1978) maintained that the public's perceptions of environmental issues fluctuate with media coverage. Downs referred to this process as the "issue-attention cycle." Environmental issues, for the purpose of this study, were defined as "news items relating to humanity's unintentional disruption of the ecological system" (Atwater et al, 1985: 395).

The independent variable, the media agenda, consisted of a content analysis of environmental stories in the three largest circulation local and regional daily newspapers serving the Lansing,

Michigan, area—the Lansing State Journal, the Detroit Free Press, and ¹The Detroit News. The papers were examined over a 239-day period, from October 5, 1983, to May 30, 1984.

Since media priorities of news topics are often exhibited through prominence of story treatment and display, only the front sections were analyzed. All nonadvertising content was analyzed, including news stories, photographs, cartoons, letters to the editor, editorials, obituaries, etc. Each story was weighted for column inches, based on two-inch wide columns and the page on which the story initially appeared. ²The seven issues related to the global issue of the environment were: 1) hazardous substances, 2) disposal of wastes, 3) quality of water, 4) quality of land, 5) quality of air, 6) wildlife conservation, and 7) noise pollution. The first six issues were selected because a pre-test found them to be the environmental issues receiving the most coverage in the three newspapers examined in this study. The issue of noise pollution was included to see whether audience members attached little salience to an issue that received ³little media coverage.

The dependent variable, the public agenda, consisted of the aggregate measure of the public's priorities of the seven ⁴environmental issues. To obtain this measure, three waves of respondents drawn from the same population were observed. Respondents were randomly selected from the most recent Lansing area telephone directory. The last digit of each number was increased by one to permit audience members with unlisted numbers to be included in the samples. Since the public's priorities of issues in the news fluctuates with media coverage, according to the agenda-setting hypothesis, the durations of the waves were kept as short as possible.

The first wave of respondents was contacted during the evenings of December 5-7, 1983. The second wave was contacted during the evenings of April 11-12, 1984. The final wave was contacted during the evenings of May 30-31, 1984. The surveys were conducted concurrently with the on-going content analysis. The surveys occurred after eight, 26 and all 33 weeks of media content, respectively. The initiation of the surveys after these periods was selected so as to have surveys spaced widely apart. The last survey was conducted on the day the content analysis concluded. Such a design permitted powerful inferences about change in audience cognitions of environmental issues over time vis-a-vis media coverage of those issues. Each respondent's intrapersonal agenda was measured by asking him or her how important he or she personally regarded each of the environmental issues on a Likert-type scale.⁵ Although other measures of audience salience have been conceptualized, such as perceived-community salience, interpersonal salience, and perceived-media salience, intrapersonal salience was used in the present study because it reflects McCombs and Shaw's (1972) original conceptualization of agenda-setting, based on Lippmann's (1922) assertion that the mass media structure and create the public's cognitions of reality (c.f., McLeod et al., 1974; DeGeorge, 1981).

RESULTS

A total of 1,145 respondents were contacted during the three waves, of whom 880 responded (Wave 1, N=304; Wave 2, N=291; Wave 3, N=285), for a total response rate of 77 percent. The demographic data showed no significant differences among waves, and the demographic

Characteristics of the respondents in the samples compared favorably to census data. An indication of the unobtrusive nature of environmental issues was obtained during the last two waves using a measure developed by Murch (1971). Respondents were asked to evaluate how serious environmental problems are both in the nation and in the Lansing area. During both waves, T-tests showed that respondents found environmental problems to be significantly more serious in the nation than in their own area. Thus, it can be inferred that respondents viewed the problem as something affecting other people outside the Lansing area, not themselves and other Lansing area residents.

A total of 707 stories were examined. The environmental issues were rank-ordered, based on the amount of weighted column inches, so they could be correlated with the rank measures of the public agenda at various time points. In order of importance the rankings were: 1) Hazardous substances, 2) Disposal of wastes, 3) Quality of air, 4) Quality of water, 5) wildlife conservation, 6) Quality of land, and 7) noise pollution. It was determined a priori to set the ranks according to weighted column inches rather than number of stories. This was done because the weighting process takes into account the length, display, and prominence of media treatment, which the agenda-setting hypothesis asserts goes into the public's information processing in forming their cognitions of issue salience.⁶

Table 1 shows the accumulated week-by-week Spearman rank-order correlations between the eight-week long media agenda (i.e., the eight weeks of media content preceding the first survey wave) and the first wave public agenda. The results show no clear evidence for an optimal agenda duration or an increasing-peaking-and-leveling path. The

correlation between the audience agenda and the media agenda for the week before the survey (November 27 to December 3, 1983) was a low .18. The relationship climbed to .41 when the media agenda was extended to two weeks before the survey (November 20 to December 3). That increase, however, did not mark a trend. The increase may have been a chance finding due to the volatility of data with such a small number of issues. Since the data were susceptible to marked changes with fluctuations in the rank orderings of either variable, and because of the large number of reported results making occasional significant findings possible by capitalization on chance, the findings reported here focused on trends rather than significant results. In this way the study took advantage of its major strength:
7
reliability through repeated measures.

Table 1 about here

Table 2 shows the relationship between the public agenda with the media agenda over the 26 weeks of media content prior to the wave 2 survey. The data show an increasing trend of correlations between the media agenda and the public agenda as the media agenda is drawn back in time and accumulated in week-long intervals. The correlations begin to climb sharply after the accumulation of six weeks of media content, with a correlation of .50. That trend continues after the accumulation of seven and eight weeks with correlations of .61 and .65, respectively. The relationship peaks after the accumulation of nine and ten weeks with correlations of .77 ($p < .05$) and then steadily

declines. While the data show an increase, peak, and decline, the rate of the decension after the peak is not nearly as sharp as the rate of ascension before the peak.

Table 2 about here

Table 3 shows the relationship between the public agenda with the media agenda for the entire 33-week media agenda duration. Unlike the previous waves, the correlations ascend rapidly. By the second week there is a strong relationship ($\rho = .71$, $p < .05$). The relationship increased as the time period was extended. A correlation of .93 ($p < .01$) was attained by the seventh week. This strong relationship stabilized until the 14th week when it increased to a near-perfect relationship. Even though the data show some decline after the accumulation of 25 weeks of media coverage ($\rho = .82$), the correlations again, as with wave 2, remain high throughout the rest of the sample period.

Table 3 about here

As with wave 2, the data show an increase, peak or level, and decline. A period of leveling emerged during the seventh week and didn't begin to decline until the 25th week. Once again, the ascension of the correlations before the peak was much sharper than the decension after the peak. During the ends of waves 2 and 3 the correlations tended to increase slightly.

DISCUSSION

Most agenda-setting research has conceptualized and operationalized the media agenda in terms of the amount of media coverage, and perhaps the prominence of media coverage, as the crucial factor explaining media impact on aggregate audience cognitions. This study conceptualized and operationalized the media agenda in terms of the amount of time the media devoted to a set of related issues in the news. The study veered from the traditional design by subdividing the media agenda into week-long intervals and correlating the public agenda with accumulating week-long intervals of the media agenda. In this way the study sought to plot the rise and fall of media coverage on the public's cognitions. Three sample waves were obtained. Determining the optimal effect span of media issue coverage on public issue salience and the hypothesized increase, peak, and decline in the relationship between the media agenda and the public agenda requires examination of all the data during all the waves and locating trends. Significant correlations, while worth noting, are not by themselves of great importance since with the large number of reported correlations and the small number of issues occasional significant findings may have occurred by chance.

Wave 1 showed no evidence for an optimal effect span of media coverage on public cognitions or a rising-peaking-and-falling path. However, the eight weeks of media content observed prior to the first survey wave may have been too short a duration for the media to have any noticeable agenda-setting effect. Wave 2 showed the initial ascension of correlations clearly after six weeks. The ascension of correlations continued through weeks seven and eight and peaked during

weeks nine and ten. Wave 3 showed high correlations during the entire sample period. Nevertheless, the relationship increased after the accumulation of five and six weeks of media coverage and leveled afterwards. As a result of these findings, it appears that the first indication of public adoption of media salience of environmental issues manifests itself after the accumulation of five to seven weeks of media coverage. The period of peak or optimal relationship between the public agenda and the audience agenda (i.e., the optimal effect span) appears after the accumulation of about eight to ten weeks of media coverage. The period may be more aptly described as "leveling" rather than "peaking" since the decension of the correlations after adoption of the media priorities is much less than the initial ascension before adoption.

In general, the data supported the hypothesis concerning the shape of the relationship. During the second and third waves, when there was enough data to make inferences about the path of the relationship between the media agenda and public agenda, the relationship quickly climbed and then peaked or leveled and slowly declined. While the relationship decreased after that point, the descent was not as sharp or distinct as the initial increase. These repeated findings suggest that while audience members may learn about the salience of news media fare about environmental issues quite rapidly after the outset of media coverage, they tend to regard such issues as salient for some time even after media coverage decreases.

The correlations were sometimes quite different among the three waves. During the third wave, in particular, the correlations were sometimes very high. Considering the small number of issues, correlations may be expected to fluctuate by chance. The third wave

may have also yielded higher correlations because a well-publicized issue (i.e., agent orange, which was coded as hazardous substances) received heavy media coverage. Regardless, what was of critical importance was the re-occurring trend of rising, peaking, or leveling, and slowly falling correlations during the last two waves, and the repeated evidence for the optimal effect span of media coverage on the cognitions of the public.

These findings raise the question as to what cognitive processes are going on among the public during the passage of time while the news media are covering an issue. After all, time alone does nothing. Zajonc (1968), based on the findings of several laboratory experiments, has suggested that if subjects are exposed to a neutral object for some duration of time, merely thinking about the object can lead to a positive disposition toward the object. Issues in the news, of course, do not usually deal with neutral topics; and agenda-setting does not measure people's dispositions or attitudes toward issues in the news, but merely their cognitions about issues in the news. Nevertheless, it is possible to conceive of a similar process whereby merely thinking about issues may legitimize issues. The mass media, of course, play a vital role in determining whether people will think about issues. As Cohen (1963: 13) observed in an often-cited quote in many agenda-setting studies: The mass media may not be very powerful at telling us what to think, but they are stunningly powerful at telling us what to think about. Thus, by simply keeping an issue "alive" by reporting about it for some duration the media may transmit to the public more than just information, but also a subtle message concerning the legitimacy of such an issue. The very fact that an

issue has survived in the media for some duration while other issues have come and gone may communicate to the public that the issue is worth putting high on the public agenda of issue priorities. This study found that with an unobtrusive issue the news media may have a relatively immediate impact on the public's cognitions about the importance and legitimacy of the issue. Such an issue, for most audience members, may not be a "neutral" issue, strictly speaking. But since the issue does not directly impact on most people's lives the issue is not as relevant to most people as an obtrusive issue. Issues that are obtrusive may have little or no impact on the public's cognitions after any period of time. Winter et al. (1982) found that economic issues, which obtrude into people's daily lives, require media coverage for a far longer duration than unobtrusive issues to have an agenda-setting effect.

The optimal media effect span found here is of little theoretical import except to the extent that it adds to our knowledge concerning the relative speed of the impact of media coverage of obtrusive and unobtrusive issues in agenda-setting. The rising-peaking-and-falling path may be of greater theoretical importance because it illustrates the cumulative impact of media coverage on the public over time. It is worth making an analogy between news diffusion research and agenda-setting research to understand the temporal process since diffusion clearly conceives of the role of time. As Chaffee (1975) noted in his discussion of the frequently reoccurring S-curve in news diffusion research, there is nothing amazing about the reoccurrence of the curve at all. It is in fact nothing more than a normal or bell-shaped curve. Hypothesizing such a curve may be tantamount to simply supporting rather than refuting the null hypothesis. Nevertheless,

agenda-setting research has not yielded a consistent path in the relationship between media coverage and public salience similar to the S-curve in news diffusion research. If this path is found to reoccur in agenda-setting, then agenda-setting researchers should focus their research energies on locating those "constraints" that cause the curve to not manifest itself, or manifest itself at a slower rate. One such constraint suggested for the findings here deals with issue obtrusiveness.

Finally, something should be said about the descending paths found after the leveling periods during the last two waves. It was found that the rise before the peak manifested itself much more rapidly than the fall after the peak. This rapid rise should not be surprising, especially with the unobtrusive issue examined here. The rise represents public learning (of media salience). With an obtrusive issue we might expect the ascent before the curve to rise less rapidly. Members of the public have direct experience with such an issue and as a result a constraint may exist mediating the agenda-setting impact. But with an unobtrusive issue no such constraint exists. The rapid initial rise of correlations therefore may be akin to the rapid initial rise of the S-curve in diffusion research. The fact that the the paths found in this study descend relatively slowly after the peak suggests that forgetting about media issue salience is slow. Again, this is not surprising. Once people learn about salient issues they are likely to continue to regard such issues as salient for some time even after media coverage decreases.

NOTES

1. Together these newspapers accounted for nearly 100 percent of the daily circulation in the Lansing Area.

2. The following formula was used:

$$\frac{Np - (P - 1)}{Np} \times CI$$

Where: Np = number of pages in the front section
P = page of first appearance of story
(up to page four)
CI = column inches

3. Three coders examined each story to check for intercoder reliability. The story was coded the way two or all three coders agreed. When there was no agreement among coders, the story was not included in the sample. Coders were given the opportunity to refuse to make a coding decision if they believed the stories did not fall into any of the categories, in which case the stories were coded as disagreements. The intercoder reliability coefficient was 94 percent.

4. Noise pollution was not included in the first wave survey.

5. During Wave 1 a 0-10 point scale was used. Later waves used a 0-7 scale to avoid a preponderance of zero, five and ten responses.

6. Stone and McCombs (1981) have reported that there is a high correlation (about +.90) between using number of stories and column inches to determine the media agenda.

7. See Winter et al. (1982: 2) for a discussion concerning the use of the small N of usually seven or eight issues in agenda-setting research.

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Table 1: The Accumulating Week-By-Week Correlations Between
the Public Agenda and the Media Agenda (Wave 1)

Cumulative Weeks	rho	Cumulative Weeks	rho
1	.18	5	.09
2	.41	6	.17
3	.17	7	.09
4	.09	8	.41

Table 2: The Accumulating Week-By-Week Correlations Between
the Public Agenda and the Media Agenda (Wave 2)

Cumulative Weeks	rho	Cumulative Weeks	rho
1	.18	14	.50
2	.28	15	.50
3	.32	16	.43
4	.23	17	.43
5	.25	18	.39
6	.50	19	.43
7	.61	20	.43
8	.65	21	.43
9	.77*	22	.50
10	.77*	23	.50
11	.65	24	.50
12	.61	25	.61
13	.43	26	.61

*Significant at the .05 level

Table 3: The Accumulating Week-By-Week Correlations Between
the Public Agenda and the Media Agenda (Wave 3)

Cumulative Weeks	rho	Cumulative Weeks	rho	Cumulative Weeks	rho
1	.36	12	.93**	23	.93**
2	.71*	13	.93**	24	.93**
3	.76*	14	.98**	25	.82*
4	.87*	15	.98**	26	.82*
5	.76*	16	.98**	27	.82*
6	.87*	17	.98**	28	.82*
7	.93**	18	.93**	29	.76*
8	.93**	19	.93**	30	.82*
9	.93**	20	.93**	31	.82*
10	.93**	21	.93**	32	.87*
11	.93**	22	.93**	33	.87*

*Significant at the .05 level

**Significant at the .01 level